DOCUMENTATION OF ENVIRONMENTAL INDICATOR DETERMINATION
Interim Final 2/5/99
RCRA Corrective Action
Environmental Indicator (EI) RCRIS code (CA750)
Migration of Contaminated Groundwater Under Control

Facility Name:	**Clean Harbors Environmental Service, Inc. (CHES)**
Facility Address:	**7515 Harvest Road, Prince George, VA**
Facility EPA ID #:	**VAD988175055**

1. Has **all** available relevant/significant information on known and reasonably suspected releases to the groundwater media, subject to RCRA Corrective Action (e.g., from Solid Waste Management Units (SWMU), Regulated Units (RU), and Areas of Concern (AOC)), been **considered** in this EI determination?

   __X__ If yes – check here and continue with #2 below.

   _____ If no – re-evaluate existing data, or

   _____ If data are not available skip to #6 and enter "IN" (more information needed) status code.

BACKGROUND

Definition of Environmental Indicators (for the RCRA Corrective Action)
Environmental Indicators (EI) are measures being used by the RCRA Corrective Action program to go beyond programmatic activity measures (e.g., reports received and approved, etc.) to track changes in the quality of the environment. The two EI developed to-date indicate the quality of the environment in relation to current human exposures to contamination and the migration of contaminated groundwater. An EI for non-human (ecological) receptors is intended to be developed in the future.

Definition of "Migration of Contaminated Groundwater Under Control" EI
A positive "Migration of Contaminated Groundwater Under Control" EI determination ("YE" status code) indicates that the migration of "contaminated" groundwater has stabilized, and that monitoring will be conducted to confirm that contaminated groundwater remains within the original "area of contaminated groundwater" (for all groundwater "contamination" subject to RCRA corrective action at or from the identified facility (i.e., site-wide)).

Relationship of EI to Final Remedies
While Final remedies remain the long-term objective of the RCRA Corrective Action program the EI are near-term objectives which are currently being used as Program measures for the Government Performance and Results Act of 1993, GPRA). The "Migration of Contaminated Groundwater Under Control" EI pertains ONLY to the physical migration (i.e., further spread) of contaminated ground water and contaminants within groundwater (e.g., non-aqueous phase liquids or NAPLs). Achieving this EI does not substitute for achieving other stabilization or final remedy requirements and expectations associated with sources of contamination and the need to restore, wherever practicable, contaminated groundwater to be suitable for its designated current and future uses.

Duration / Applicability of EI Determinations
EI Determinations status codes should remain in RCRIS national database ONLY as long as they remain true (i.e., RCRIS status codes must be changed when the regulatory authorities become aware of contrary information).

2. Is **groundwater** known or reasonably suspected to be "**contaminated**" [1] above appropriately protective "levels" (i.e., applicable promulgated standards, as well as other appropriate standards, guidelines, guidance, or criteria) from releases subject to RCRA Corrective Action, anywhere at, or from, the facility?

   _X_ If yes – continue after identifying key contaminants, citing appropriate "levels", and referencing supporting documentation.

   _____ If no – skip to #8 and enter "YE" status code, after citing appropriate "levels", and referencing supporting documentation to demonstrate that groundwater is not "contaminated."

   _____ If unknown – skip to #8 and enter "IN" status code.

Rationale and Reference(s):

The facility is located at 7515 Harvest Road, in Prince George, Virginia, and began operation as Belpar Environmental in the 1980's, and was acquired by Chemical Waste Management (CWM) of Oak Brook, Illinois. CWM submitted a Hazardous Waste Permit Part A Application in January 1992. CWM operations at the site included lab packaging, underground storage tank removal and installation services, processing, storage, and transportation of waste, and acceptance of waste oil, which was subsequently shipped off-site for treatment and/or disposal.

Clean Harbors began leasing the property in September 1994, when it purchased the operations from CWM. The 3.29-acre property is leased from A.A. Forbes of Prince George, Virginia. Clean Harbors operated the facility under Interim Status, and submitted a Part B Application in February 1997. During Clean Harbor's operation, the site has been used as a hazardous and non-hazardous waste storage and treatment facility. Clean Harbors subsequently withdrew the part B Application on August 27, 2001, after undergoing RCRA closure of the tank farm, and operated as a wastewater treatment facility regulated under the Clean Water Act (CWA) until 2004. During CHES' operation, hazardous waste process continued in the tank farm until 2001, when the tank farm was closed. Waste codes applicable to site activities included D001 (Ignitability), D008 (Lead), and D018 (benzene). Non-hazardous waste treatment and disposal continued until July 2002. Oil sludge was solidified in a solidification pan on the concrete pad located on the western portion of the site. This practice ceased in 2004. The site is currently used as a service center for oil and hazardous material spill response activities and scheduled environmental services.

The site is located in Forbes Industrial Park, within a lightly developed agricultural/residential/ industrial region of Prince George, Virginia. The industrial park is located along Route 156, approximately 20 miles southeast of Richmond, and within 0.5 mile of the Hopewell city limits. The site is topographically relatively flat and lies at an elevation of approximately 130 feet above mean sea level. There are no waterways or wetlands on the site. A surface water surface impoundment is located on the adjacent property east of the facility site; the surface impoundment receives stormwater from the Clean Harbors facility and other adjacent properties in the Forbes Industrial Park.

There are two buildings located on the northwest portion of the site. The larger building is a 5,000 square-foot one story metal building which houses a former laboratory, a boiler, and general maintenance equipment and supplies. The second building is comprised of two large trailers and is used as office space.

A 5,000-gallon diesel aboveground storage tank (AST) is located west of the main building, and currently contains fuel for equipment and vehicles. One inactive hazardous waste AST and four inactive non-hazardous waste ASTs are located in a concrete-lined tank farm located southeast of the main building. The tank farm was RCRA "clean closed" in 2001. Two 20,000-gallon fractionation (frac) tanks are located southwest of the tank farm, and are used to temporarily hold stormwater that collects in the tank farm and an adjacent containment dike.

The active portion of the site, where treatment and storage of hazardous waste has occurred, is located on the southern portion of the property and is completely enclosed by a chain-link fence. A 60-foot by 65-foot concrete

pad is located on the eastern portion of the site and is currently used to park box trailers, where truck to truck transfer operations occur. Empty roll-off containers are stored along the southern fence line of the site. West of the roll-off containers are large capacity decommissioned ASTs awaiting disposal. A large metal solidification pan, currently not in use, is stored adjacent to these ASTs. North of this area is a sea van used for storage of supplies, and northwest of the sea van is a storage shed and canopy used for additional storage of spill response supplies. With the exception of the concrete pad, the tank farm and containment dike, the site is unpaved and covered with gravel, soil, or vegetation. A site plan of the Clean Harbors facility is attached

During CWM's operation of the facility, solid and hazardous waste treatment and storage was conducted in two areas: in the tank farm and on the concrete pad in the eastern portion of the facility. During Clean Harbors operation, hazardous waste processes continued in the tank farm until 2001, when the tank farm was "clean closed" under the RCRA. Oily sludge was solidified in a solidification pan on the concrete pad, and this operation ceased in 2004. Currently truck-to-truck transfer of containerized waste occurs on the concrete pad. These wastes are subsequently transported off-site for treatment and/or disposal at appropriate facilities.

In 1994, a groundwater (GW) investigation was conducted by Environmental Resource Management, Inc. (ERM) as part of a combined Phase I/II assessment requested by CHES at the time of their property purchase. Three GW monitoring wells (MW-1, MW-2, MW-3) were installed, surveyed and used to collect chemical analytical data and GW elevation data. The 1994 data suggests GW onsite flows to the southwest and drains to the Blackwater Swamp with periodic discharge to an adjacent (eastward) surface impoundment during dry periods. GW samples were collected from MW-1, MW-2, MW-3, pre-existing well AB-2 and an abandoned water supply well. All samples were analyzed for VOCs, SVOCs, PCBs and TPH (Total Petroleum Hydrocarbons). MTBE (Methyl-t-butyl ether) was detected in MW-2 and the abandoned supply well at concentrations of 79µg/l and 48µg/l, respectively, which were above its EPA Region III risk-based concentration (RBC) for tap water of 2.6 µg/l. Additionally, di-n-butylphthalate was detected in all but one well at concentrations ranging from 10 µg/l to 12 µg/l, which were below the RBC for tap water of 3,650 µg/l. Other potential contaminants include PCBs (Polychlorinated biphenyl compounds) and TPH. However, concentrations for these constituents, PCBs and TPH, were not detected in groundwater samples above laboratory detection limits during the 1994 evaluation. No other GW data are available.

Eight (8) possible source areas were identified by ERM (ERM-1 to ERM-8). Six (6) AOCs and two (2) SWMUs, some of which corresponded to ERM source areas, were identified by EPA, VADEQ and CHES at an August-2005 meeting based on the existing information and site inspection. Other potential source areas located at the site include a 5000 gallon diesel fuel AST (AOC-7) and a former septic system leach field (AOC-8).

On July 12, 2007, CHES prepared and submitted RCRA Facility Investigation (RFI) Work Plan, revised in March 2008. The RFI Work Plan proposes redevelopment and sampling of all accessible GW wells at the facility. Because the only constituents detected by ERM were petroleum-related, the proposed analytical suite contains VOCs and SVOCs from Appendix VIII to 40 CFR 261 and from Appendix IX to 40 CFR 264, rather than TPHs. GW will also be analyzed for the metals, including lead, listed in Appendix IX to 40 CFR 264. GW samples will not need to be initially analyzed for PCBs. Soil samples will be analyzed first for presence of PCBs, and if detected (or above SSLs) then the GW would be analyzed for PCBs. GW elevation data will also be collected and GW flow direction confirmed. The facility also plans to survey the elevation of the adjacent surface impoundment to gain a better understanding of the hydrologic relationship between the impoundment and the uppermost aquifer.

A site well location and groundwater elevation map and a table of GW Data from ERM are attached.

Groundwater in the site area is used for drinking water via water supply wells on each property. The water quality is reportedly poor due to high sulfur content, and drinking water at the site is supplemented by bottled water or other water delivery service. Domestic waste water is disposed via a municipal sewer service available to the industrial park. On-site septic systems may also be employed at nearby properties. The site was connected to the municipal sewer in the late 1990s.

The location of water supply wells on surrounding properties will be determined during the RFI. If information cannot be obtained from the property occupants, government agencies will be contacted to obtain the information.

The only nearby surface water body is the easterly adjacent impoundment. The impoundment receives stormwater runoff from surrounding properties. It comprises an area of approximately 19,000 square feet and is not used for recreational purposes.

Access to the site is restricted by a chain-link fence that surrounds the entire active facility. Access to the facility is via a gate north of the main building, which is locked at all times. Another locked gate is located along the eastern fence line, but typically not used. With the exception of AOC-8 (leach field) and AOC-9 (abandoned septic tank), all AOCs or SWMUs are located within the fenced facility. Surrounding property is used or zoned for commercial or light industrial purposes. The adjacent land west, north and east of the site is undeveloped.

References:

1. RCRA Facility Investigation Workplan by CHES (Initial July 12, 2007, revised March 14, 2008)
2. Environmental Site Assessment: Chemical Waste Management Hopewell Facility by Environmental Resources Management, Inc. (ERM) August 1, 1994
3. EPA Risk Based Screening Levels

Footnotes:

[1] "Contamination" and "contaminated" describes media containing contaminants (in any form, NAPL and/or dissolved, vapors, or solids, that are subject to RCRA) in concentrations in excess of appropriate "levels" (appropriate for the protection of the groundwater resource and its beneficial uses).

3. Has the **migration** of contaminated groundwater **stabilized** (such that contaminated groundwater is expected to remain within "existing area of contaminated groundwater"[2] as defined by the monitoring locations designated at the time of this determination)?

____ If yes – continue after presenting or referencing the physical evidence (e.g., groundwater sampling/measurement/migration barrier data) and rationale why contaminated groundwater is expected to remain within the (horizontal or vertical) dimensions of the "existing area of groundwater contamination"[2]).

_____ If no (contaminated groundwater is observed or expected to migrate beyond the designated locations defining the "existing area of groundwater contamination"[2]) – skip to #8 and enter "NO" status code, after providing an explanation.

__X__ If unknown – skip to #8 and enter "IN" status code.

Rationale and Reference(s):

As indicated in #Item 2, only one (1) sampling event was conducted fourteen years ago (1994). During this event, concentrations of MTBE above risk-based concentration screening levels were detected in two wells. There are not enough GW monitoring data to assess site-wide GW quality and to determine the extent of MTBE contamination. Additional contaminants may have been released into the groundwater on site from spills that occurred after CHES purchased the facility and began to operate.

On July 12, 2007, CHES prepared and submitted RCRA Facility Investigation (RFI) Workplan, with a revision in March 2008. When the RFI is completed, contaminants and their concentrations will be known and it will be possible to delineate the existing area(s) of contamination, if any.

<u>References:</u>
RCRA Facility Investigation Workplan (revised March 2008)

Footnotes:

[2] "existing area of contaminated groundwater" is an area (with horizontal and vertical dimensions) that has been verifiably demonstrated to contain all relevant groundwater contamination for this determination, and is defined by designated (monitoring) locations proximate to the outer perimeter of "contamination" that can and will be sampled/tested in the future to physically verify that all "contaminated" groundwater remains within this area, and that the further migration of "contaminated" groundwater is not occurring. Reasonable allowances in the proximity of the monitoring locations are permissible to incorporate formal remedy decisions (i.e., including public participation) allowing a limited area for natural attenuation.

4. Does "contaminated" groundwater **discharge** into **surface water** bodies?

_____ If yes – continue after identifying potentially affected surface water bodies

_____ If no – skip to #7 (and enter a "YE" status code in #8, if #7 = yes) after providing an explanation and/or referencing documentation supporting that groundwater "contamination" does not enter surface water bodies

_____If unknown – skip to #8 and enter "IN" status code.

Rationale and Reference(s):

5. Is the **discharge** of "contaminated" groundwater into surface water likely to be **"insignificant"** (i.e., the maximum concentration[3] of each contaminant discharging into surface water is less than 10 times their appropriate groundwater "level," and there are no other conditions (e.g., the nature, and number, of discharging contaminants, or environmental setting), which significantly increase the potential for unacceptable impacts to surface water, sediments, or eco-systems at these concentrations)?

____ If yes – skip to #7 (and enter "YE" status code in #8 if #7 = yes), after documenting: 1) the maximum known or reasonably suspected concentration[3] of key contaminants discharged above their groundwater "level," the value of the appropriate "level(s)," and if there is evidence that the concentrations are increasing; and 2) provide a statement of professional judgement/explanation (or reference documentation) supporting that the discharge of groundwater contaminants into the surface water is not anticipated to have unacceptable impacts to the receiving surface water, sediments, or eco-system.

____ If no – (the discharge of "contaminated" groundwater into surface water is potentially significant) - continue after documenting: 1) the maximum known or reasonably suspected concentration[3] of each contaminant discharged above its groundwater "level," the value of the appropriate "level(s)," and if there is evidence that the concentrations are increasing; and 2) for any contaminants discharging into surface water in concentrations[3] greater than 100 times their appropriate groundwater "levels," the estimated total amount (mass in kg/yr) of each of these contaminants that are being discharged (loaded) into the surface water body (at the time of the determination), and identify if there is evidence that the amount of discharging contaminants is increasing.

____ If unknown – skip to #8 and enter "IN" status code.

Rationale and Reference(s):

Footnotes:

[3]- As measured in groundwater prior to entry to the groundwater-surface water/sediment interaction (e.g., hyporheic) zone.

6. Can the **discharge** of "contaminated" groundwater into surface water be shown to be "**currently acceptable**" (i.e., not cause impacts to surface water, sediments or eco-systems that should not be allowed to continue until a final remedy decision can be made and implemented[4])?

_____ If yes – continue after either:

(1) identifying the Final Remedy decision incorporating these conditions, or other site-specific criteria (developed for the protection of the site's surface water, sediments, and ecosystems), and referencing supporting documentation demonstrating that these criteria are not exceeded by the discharging groundwater; OR

(2) providing or referencing an interim-assessment[5], appropriate to the potential for impact, that shows the discharge of groundwater contaminants into the surface water is (in the opinion of a trained specialists, including ecologist) adequately protective of receiving surface water, sediments, and eco-systems, until such time when a full assessment and final remedy decision can be made. Factors which should be considered in the interim-assessment (where appropriate to help identify the impact associated with discharging groundwater) include: surface water body size, flow, use/classification/habitats and contaminant loading limits, other sources of surface water/sediment contamination, surface water and sediment sample results and comparisons to available and appropriate surface water and sediment "levels," as well as any other factors, such as effects on ecological receptors (e.g., via bio-assays/benthic surveys or site-specific ecological Risk Assessments), that the overseeing regulatory agency would deem appropriate for making the EI determination..

_____ If no – (the discharge of "contaminated" groundwater into surface water is potentially significant) continue after documenting: 1) the maximum known or reasonably suspected concentration[3] of <u>each</u> contaminant discharged above its groundwater "level," the value of the appropriate "level(s)," and if there is evidence that the concentrations are increasing; and 2) for any contaminants discharging into surface water in concentrations[3] greater than 100 times their appropriate groundwater "levels," the estimated total amount (mass in kg/yr) of each of these contaminants that are being discharged (loaded) into the surface water body (at the time of the determination), and identify if there is evidence that the amount of discharging contaminants is increasing.

_____ If unknown – skip to #8 and enter "IN" status code.

Rationale and Reference(s):

Footnotes:

[4] Note, because areas of inflowing groundwater can be critical habitats (e.g., nurseries or thermal refugia) for many species, appropriate specialist (e.g., ecologist) should be included in management decisions that could eliminate these areas by significantly altering or reversing groundwater flow pathways near surface water bodies.

[5] The understanding of the impacts of contaminated groundwater discharges into surface water bodies is a rapidly developing field and reviewers are encouraged to look to the latest guidance for the appropriate methods and scale of demonstration to be reasonably certain that discharges are not causing currently unacceptable impacts to the surface waters, sediments or eco-systems.

7. Will groundwater **monitoring** / measurement data (and surface water/sediment/ecological data, as necessary) be collected in the future to verify that contaminated groundwater has remained within the horizontal (or vertical, as necessary) dimensions of the "existing area of contaminated groundwater?"

___ If yes – continue after providing or citing documentation for planned activities or future sampling/measurement events. Specifically identify the well/measurement locations which will be tested in the future to verify the expectation (identified in #3) that groundwater contamination will not be migrating horizontally (or vertically, as necessary) beyond the "existing area of groundwater contamination."

_____ If no – enter "NO" status code in #8. skip to #7 (and enter a "YE" status code in #8, if #7 = yes) after providing an explanation and/or referencing documentation supporting that groundwater "contamination" does not enter surface water bodies

_____ If unknown – skip to #8 and enter "IN" status code.

Rationale and Reference(s):

8. Check the appropriate RCRIS status codes for the Migration of Contaminated Groundwater Under Control EI (event code CA750), and obtain Supervisor (or appropriate Manager) signature and date on the EI determination below (attach appropriate supporting documentation as well as a map of the facility).

_____ YE – Yes, "Migration of Contaminated Groundwater Under Control" has been verified. Based on a review of the information contained in this EI determination, it has been determined that the "Migration of Contaminated Groundwater" is "Under Control" at the Clean Harbors facility, **EPA ID #** VAD988175055, located in 7515 Harvest Road, Prince George, VA. Specifically, this determination indicates that the migration of "contaminated" groundwater is under control, and that monitoring will be conducted to confirm that contaminated groundwater remains within the "existing area of contaminated groundwater" This determination will be re-evaluated when the Agency becomes aware of significant changes at the facility.

_____ NO – Unacceptable migration of contaminated groundwater is observed or expected.

__X__ IN – More information is needed to make a determination.

Completed by		Fuxing Zhou	Date	9/9/08
	(Print)	Fuxing Zhou		
	(Title)	Environmental Specialist II		

Supervisor		Leslie A. Romanchik	Date	9/15/08
	(Print)	Leslie A. Romanchik		
	(Title)	Director, Office of Hazardous Waste		
	(EPA Region or State)	III/VA		

Locations where References may be found:

Department of Environmental Quality
Office of Hazardous Waste, Groundwater
629 East Main Street
Richmond, VA 23219

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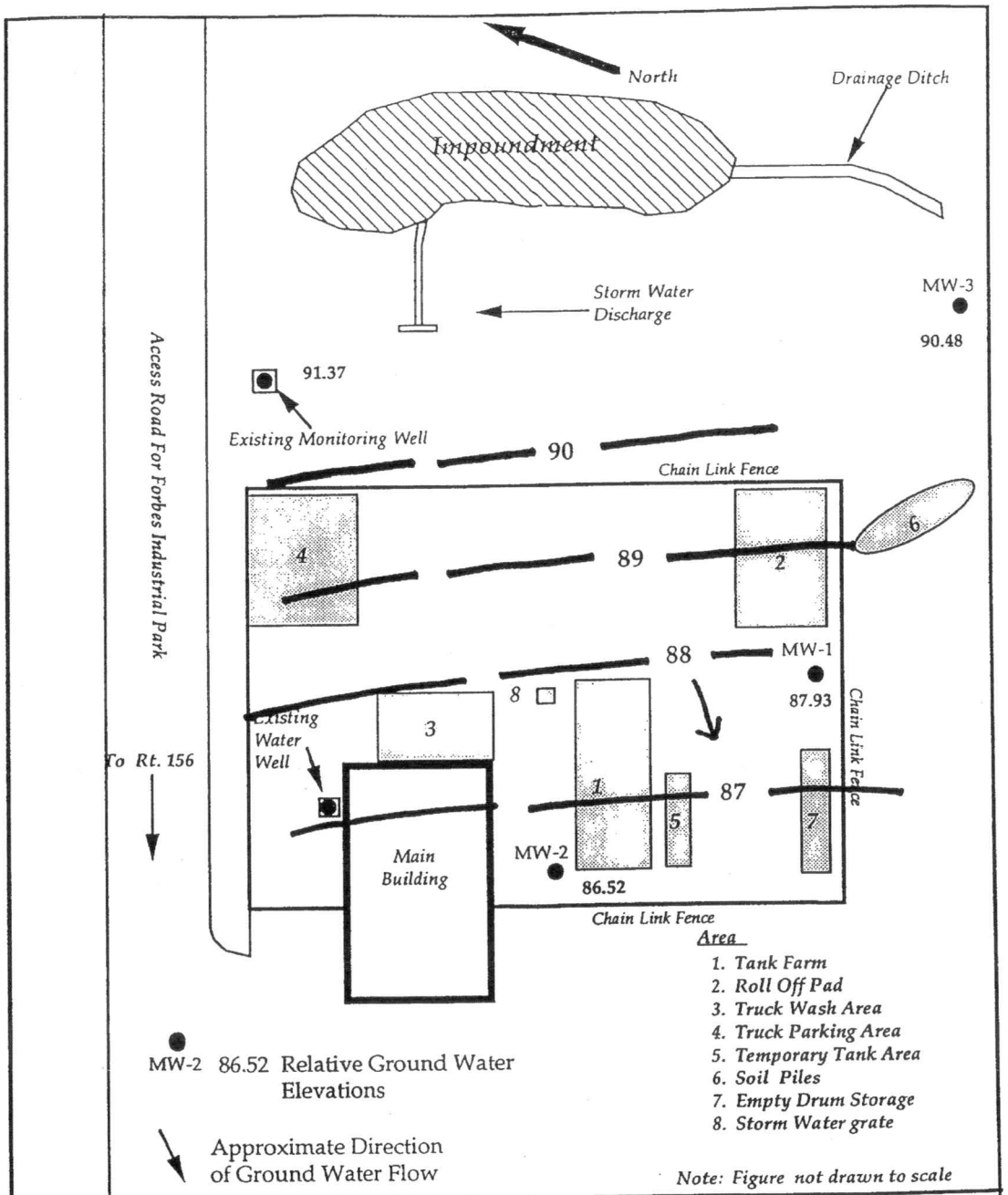
Attachments:

- **Well Location and GW Elevation Map**
- **GW Data Table**



W.O. # : H0504.00.01	*Figure 5*	ERM
Drawn By /Date: SR / 5-23-94	*Ground Water Flow*	11817 Canon Blvd., Suite 308
Checked By /Date: DC/ 5-24-94	*Chemical Waste Management, Inc.*	Newport News, Virginia 23606
Revised By /Date:	*Forbes Industrial Park*	(804) 873-4853
Checked By /Date:	*Hopewell, Virginia*	

Table 2
ERM Groundwater Analytical Results

7515 Harvest Road
Prince George, Virginia

Sample ID Sample Date	MW-1 7/5/94	MW-2 7/5/94	MW-3 7/5/94	Existing Supply Well 7/5/94	Existing Monitoring Well 7/5/94
VOCs (ug/l)					
Methyl-t-butylether	ND (10)	79	ND (10)	48	ND (10)
Di-n-butylphthalate	10	11	11	12	ND (10)
SVOCs (ug/l)	ND (10-50)	ND (10-50)	ND (10-51)	ND (10-50)	ND (10-50)
PCBs (ug/l)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
TPH (mg/l)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)

ug/l = Micrograms per liter.
mg/l = Milligrams per liter.
VOCs = Volatile organic compounds.
SVOCs = Semivolatile organic compounds.
PCBs = Polychlorinated biphenyl compounds.
TPH = Total petroleum hydrocarbons.
ND = Not detected above laboratory detection limits indicated in parentheses.
(10-50) = Range of practical quantitation limit for analysis.
Source: Environmental Site Assessment: Chemical Waste Management Hopewell Facility, ERM, 1 August 1994.